

AMENDMENT AND RESPONSE UNDER 37 CFR § 1.116 - EXPEDITED PROCEDURE

Serial Number: 09/775366

Filing Date: February 1, 2001

Title: ELECTRONIC DEVICE PACKAGE

Page 3
Dkt: 303.706US1**IN THE CLAIMS**

Below is a copy and status of the pending claims.

1. (Original) An integrated circuit package comprising:
 - a substrate;
 - a die; and
 - a material having a Young's modulus of between about .1 megapascals and about 20 megapascals, at a solder reflow temperature, attaching the die to the substrate.

2. (Original) The integrated circuit package of claim 1, wherein the substrate comprises a ceramic.

3. (Original) The integrated circuit package of claim 1, wherein the die comprises one or more memory circuits.

4. (Original) The integrated circuit package of claim 1, wherein the die comprises one or more processor circuits.

5. (Original) The integrated circuit package of claim 1, wherein the die comprises one or more logic circuits.

6. (Original) The integrated circuit package of claim 1 wherein the die comprises one or more application specific integrated circuits.

7. (Original) The integrated circuit package of claim 1, wherein the material comprises a poly epoxide formed from one epoxide.

8. (Original) The integrated circuit package of claim 1, wherein the material comprises a poly epoxide formed from two or more epoxides.

AMENDMENT AND RESPONSE UNDER 37 CFR § 1.116 – EXPEDITED PROCEDURE

Serial Number: 09/775366

Filing Date: February 1, 2001

Title: ELECTRONIC DEVICE PACKAGE

Page 4
Dkt: 303.706US1

9. (Original) The integrated circuit package of claim 1, wherein the material comprises a polyacrylate.

10. (Original) The integrated circuit package of claim 1, wherein the material comprises a polyolefin.

11. (Original) The integrated circuit package of claim 1, wherein the material comprises a polyimide.

12. (Original) The integrated circuit package of claim 1, wherein the material comprises a mixture of at least two of a poly epoxide, polyacrylate, polyimide, and polyolefin.

13. (Original) The integrated circuit package of claim 1, wherein the material comprises a copolymer of at least two of a poly epoxide, a polyacrylate, polyimide, and polyolefin.

14. (Original) The integrated circuit package of claim 1, wherein the material comprises a mixture of a poly epoxide and a polyimide.

15. (Original) The integrated circuit package of claim 1, wherein the material comprises a copolymer of a poly epoxide and a polyimide.

16. (Original) The integrated circuit package of claim 1, wherein the material has a Shore A hardness of greater than about 70.

17. (Original) The integrated circuit package of claim 1, wherein the material has a Shore D hardness of greater than about 20.

18. (Currently amended) An integrated circuit package comprising:
a substrate;
a die; and

AMENDMENT AND RESPONSE UNDER 37 CFR § 1.116 - EXPEDITED PROCEDURE

Serial Number: 09/775366

Filing Date: February 1, 2001

Title: ELECTRONIC DEVICE PACKAGE

Page 5
Dkr: 303.706US1

a material having a coefficient of thermal expansion α_2 of less than about 400 (four-hundred) ppm/ $^{\circ}$ C attaching the die to the substrate, wherein the material has a Young's modulus of between .1 megapascals and about 20 megapascals, at a solder reflow temperature.

19. (Original) The integrated circuit package of claim 18, wherein the substrate comprises a single metal layer glass-epoxide.

20. (Original) The integrated circuit package of claim 18, wherein the die comprises one or more processor circuits.

21. (Original) The integrated circuit package of claim 18 wherein the die comprises one or more memory circuits.

22. (Original) The integrated circuit package of claim 18, wherein the die comprises one or more logic circuits.

23. (Original) The integrated circuit package of claim 18, wherein the die comprises one or more application specific integrated circuits.

24. (Original) The integrated circuit package of claim 18, wherein the material comprises a poly epoxide formed from one epoxide.

25. (Original) The integrated circuit package of claim 18, wherein the material comprises a poly epoxide formed from two or more epoxides.

26. (Original) The integrated circuit package of claim 18, wherein the material comprises a polyacrylate.

27. (Original) The integrated circuit package of claim 18, wherein the material comprises a polyolefin.

AMENDMENT AND RESPONSE UNDER 37 CFR § 1.116 - EXPEDITED PROCEDURE

Serial Number: 09/775366
Filing Date: February 1, 2001
Title: ELECTRONIC DEVICE PACKAGE

Page 6
Dkt: 303.706US1

28. (Original) The integrated circuit package of claim 18, wherein the material comprises a polyimide.

29. (Original) The integrated circuit package of claim 18, wherein the material comprises a mixture of at least two of a poly epoxide, polyacrylate, polyimide, and polyolefin.

30. (Original) The integrated circuit package of claim 18, wherein the material comprises a copolymer of at least two of a poly epoxide, a polyacrylate, polyimide, and polyolefin.

31. (Original) The integrated circuit package of claim 18, wherein the material comprises a mixture of a poly epoxide and a polyimide.

32. (Original) The integrated circuit package of claim 18, wherein the material comprises a copolymer of a poly epoxide and a polyimide.

33. (Original) The integrated circuit package of claim 18, wherein the material has a Shore A hardness of greater than about 70.

34. (Original) The integrated circuit package of claim 18, wherein the material has a Shore D hardness of greater than about 20.

35. (Original) An integrated circuit package comprising:

a substrate;
a die; and
a rigid die attach material attaching the die to the substrate.

36. (Original) The integrated circuit package of claim 35, wherein the substrate comprises a printed circuit board.

AMENDMENT AND RESPONSE UNDER 37 CFR § 1.116 - EXPEDITED PROCEDURE
Serial Number: 09/775366
Filing Date: February 1, 2001
Title: ELECTRONIC DEVICE PACKAGE

Page 7
Dkt: 303.706US1

37. (Original) The integrated circuit package of claim 35, wherein the die comprises a communication circuit.

38. (Original) The integrated circuit package of claim 35, wherein the die comprises one or more memory circuits.

39. (Original) The integrated circuit package of claim 35, wherein the die comprises one or more processor circuits.

40. (Original) The integrated circuit package of claim 35, wherein the die comprises one or more logic circuits.

41. (Original) The integrated circuit package of claim 35, wherein the die comprises one or more application specific integrated circuits.

42. (Original) The integrated circuit package of claim 35, wherein the rigid die attach material comprises a poly epoxide formed from one epoxide.

43. (Original) The integrated circuit package of claim 35, wherein the rigid die attach material comprises a poly epoxide formed from two or more epoxides.

44. (Original) The integrated circuit package of claim 35, wherein the rigid die attach material comprises a polyacrylate.

45. (Original) The integrated circuit package of claim 35, wherein the rigid die attach material comprises a polyolefin.

46. (Original) The integrated circuit package of claim 35, wherein the rigid die attach material comprises a polyimide.

AMENDMENT AND RESPONSE UNDER 37 CFR § 1.116 – EXPEDITED PROCEDURE

Serial Number: 09/775366

Filing Date: February 1, 2001

Title: ELECTRONIC DEVICE PACKAGE

Page 8
DKL: 303.706US1

47. (Original) The integrated circuit package of claim 35, wherein the rigid die attach material comprises a mixture of at least two of a poly epoxide, polyacrylate, polyimide, and polyolefin.

48. (Original) The integrated circuit package of claim 35, wherein the rigid die attach material comprises a copolymer of at least two of a poly epoxide, a polyacrylate, polyimide, and polyolefin.

49. (Original) The integrated circuit package of claim 35, wherein the rigid die attach material comprises a mixture of a poly epoxide and a polyimide.

50. (Original) The integrated circuit package of claim 35, wherein the rigid die attach material comprises a copolymer of a poly epoxide and a polyimide.

51. (Original) The integrated circuit package of claim 35, wherein the rigid die attach material has a Shore A hardness of greater than about 70.

52. (Original) The integrated circuit package of claim 35, wherein the rigid die attach material has a Shore D hardness of greater than about 20.

108. (Original) An integrated circuit package comprising:

a ceramic substrate;

a die; and

a material having a Young's modulus of between about .1 and about 20, at a solder reflow temperature, attaching the die to the substrate.

109. (Original) The integrated circuit package of claim 108, wherein the ceramic substrate comprises a multi-metal layer ceramic substrate.

110. (Original) The integrated circuit package of claim 108, wherein the die comprises a communication circuit fabricated on a semiconductor.

AMENDMENT AND RESPONSE UNDER 37 CFR § 1.116 – EXPEDITED PROCEDURE

Serial Number: 09/775366

Filing Date: February 1, 2001

Title: **ELECTRONIC DEVICE PACKAGE**Page 9
Dkt: 303.706US1

111. (Original) The integrated circuit package of claim 108, wherein the die comprises one or more memory circuits.

112. (Original) The integrated circuit package of claim 108, wherein the die comprises one or more processor circuits.

113. (Original) The integrated circuit package of claim 108, wherein the die comprises one or more logic circuits.

114. (Original) The integrated circuit package of claim 108, wherein the die comprises one or more application specific integrated circuits.

115. (Original) The integrated circuit package of claim 108, wherein the material comprises one or more epoxides, poly epoxides, copolymers of epoxides, or mixtures thereof.

116. (Original) The integrated circuit package of claim 108, wherein the material comprises a poly epoxide formed from one epoxide.

117. (Original) The integrated circuit package of claim 108, wherein the material comprises a poly epoxide formed from two or more epoxides.

118. (Original) The integrated circuit package of claim 108, wherein the material comprises a polyacrylate.

119. (Original) The integrated circuit package of claim 108, wherein the material comprises a polyolefin.

120. (Original) The integrated circuit package of claim 108, wherein the material comprises a polyimide.

AMENDMENT AND RESPONSE UNDER 37 CFR § 1.116 – EXPEDITED PROCEDURE

Serial Number: 09/775366

Filing Date: February 1, 2001

Title: ELECTRONIC DEVICE PACKAGE

Page 10
Dkt: 303.706US1

121. (Original) The integrated circuit package of claim 108, wherein the material comprises a mixture of at least two of a poly epoxide, polyacrylate, polyimide, and polyolefin.

122. (Original) The integrated circuit package of claim 108, wherein the material comprises a copolymer of at least two of a poly epoxide, a polyacrylate, polyimide, and polyolefin.

123. (Original) The integrated circuit package of claim 108, wherein the material comprises a mixture of a poly epoxide and a polyimide.

124. (Original) The integrated circuit package of claim 108, wherein the material comprises a copolymer of a poly epoxide and a polyimide.

125. (Original) The integrated circuit package of claim 108, wherein the material has a Shore A hardness of greater than about 70.

126. (Original) The integrated circuit package of claim 108, wherein the material has a Shore D hardness of greater than about 20.

136. (Original) An integrated circuit package comprising:
a ceramic substrate;
a die; and
a rigid die attach material attaching the die to the substrate.

137. (Original) The integrated circuit package of claim 136, wherein the ceramic substrate comprises a multilayered ceramic substrate.

138. (Original) The integrated circuit package of claim 136, wherein the die comprises germanium.

AMENDMENT AND RESPONSE UNDER 37 CFR § 1.116 - EXPEDITED PROCEDURE
Serial Number: 09/775366
Filing Date: February 1, 2001
Title: ELECTRONIC DEVICE PACKAGE

Page 11
Dkt: 303.706US1

139. (Original) The integrated circuit package of claim 136, wherein the die comprises one or more memory circuits.

140. (Original) The integrated circuit package of claim 136, wherein the die comprises one or more processor circuits.

141. (Original) The integrated circuit package of claim 136, wherein the die comprises one or more logic circuits.

142. (Original) The integrated circuit package of claim 136, wherein the die comprises one or more application specific integrated circuits.

143. (Original) The integrated circuit package of claim 136, wherein the rigid die attach material comprises one or more epoxides, poly epoxides, copolymers of epoxides, or mixtures thereof.

144. (Original) The integrated circuit package of claim 136, wherein the rigid die attach material comprises a poly epoxide formed from one epoxide.

145. (Original) The integrated circuit package of claim 136, wherein the rigid die attach material comprises a poly epoxide formed from two or more epoxides.

146. (Original) The integrated circuit package of claim 136, wherein the rigid die attach material comprises a polyacrylate.

147. (Original) The integrated circuit package of claim 136, wherein the rigid die attach material comprises a polyolefin.

AMENDMENT AND RESPONSE UNDER 37 CFR § 1.116 - EXPEDITED PROCEDURE

Serial Number: 09/775366

Filing Date: February 1, 2001

Title: ELECTRONIC DEVICE PACKAGE

Page 12
Dkt: 303.706US1

148. (Original) The integrated circuit package of claim 136, wherein the rigid die attach material comprises a polyimide.

149. (Original) The integrated circuit package of claim 136, wherein the rigid die attach material comprises a mixture of at least two of a poly epoxide, polyacrylate, polyimide, and polyolefin.

150. (Original) The integrated circuit package of claim 136, wherein the rigid die attach material comprises a copolymer of at least two of a poly epoxide, a polyacrylate, polyimide, and polyolefin.

151. (Original) The integrated circuit package of claim 136, wherein the rigid die attach material comprises a mixture of a poly epoxide and a polyimide.

152. (Original) The integrated circuit package of claim 136, wherein the rigid die attach material comprises a copolymer of a poly epoxide and a polyimide.

153. (Original) The integrated circuit package of claim 136, wherein the rigid die attach material has a Shore A hardness of greater than about 70.

154. (Original) The integrated circuit package of claim 136, wherein the rigid die attach material has a Shore D hardness of greater than about 20.

252. (Currently amended) An integrated circuit package comprising:

a substrate;

a die; and

a material having a coefficient of thermal expansion α_2 of between about one and about sixty-two ppm/ $^{\circ}$ C attaching the die to the substrate, wherein the material has a Young's modulus of between .1 megapascals and about 20 megapascals, at a solder reflow temperature.

AMENDMENT AND RESPONSE UNDER 37 CFR § 1.116 – EXPEDITED PROCEDURE
Serial Number: 09/775366
Filing Date: February 1, 2001
Title: ELECTRONIC DEVICE PACKAGE

Page 13
Dkt: 303-706US1

253. (Previously added) The integrated circuit package of claim 252, wherein the substrate comprises a single metal layer glass-epoxide.

254. (Previously added) The integrated circuit package of claim 252, wherein the die comprises one or more processor circuits.

255. (Previously added) The integrated circuit package of claim 252 wherein the die comprises one or more memory circuits.

256. (Previously added) The integrated circuit package of claim 252, wherein the die comprises one or more logic circuits.

257. (Previously added) The integrated circuit package of claim 252, wherein the die comprises one or more application specific integrated circuits.

258. (Previously added) The integrated circuit package of claim 252, wherein the material comprises a poly epoxide formed from one epoxide.

259. (Previously added) The integrated circuit package of claim 252, wherein the material comprises a poly epoxide formed from two or more epoxides.

260. (Previously added) The integrated circuit package of claim 252, wherein the material comprises a polyacrylate.

261. (Currently amended) An integrated circuit package comprising:
a substrate;
a die; and
a material having a coefficient of thermal expansion α_2 of between about 151 (one-hundred and fifty-one) and about 400 (four-hundred)] ppm/ $^{\circ}$ C attaching the die to the substrate,

AMENDMENT AND RESPONSE UNDER 37 CFR § 1.116 – EXPEDITED PROCEDURE

Serial Number: 09/775366

Filing Date: February 1, 2001

Title: ELECTRONIC DEVICE PACKAGE

Page 14
Dkt: 303.706US1

wherein the material has a Young's modulus of between .1 megapascals and about 20 megapascals, at a solder reflow temperature.

262. (Previously added) The integrated circuit package of claim 261, wherein the material comprises a polyolefin.

263. (Previously added) The integrated circuit package of claim 261, wherein the material comprises a polyimide.

264. (Previously added) The integrated circuit package of claim 261, wherein the material comprises a mixture of at least two of a poly epoxide, polyacrylate, polyimide, and polyolefin.

265. (Previously added) The integrated circuit package of claim 261, wherein the material comprises a copolymer of at least two of a poly epoxide, a polyacrylate, polyimide, and polyolefin.

266. (Previously added) The integrated circuit package of claim 261, wherein the material comprises a mixture of a poly epoxide and a polyimide.

267. (Previously added) The integrated circuit package of claim 261, wherein the material comprises a copolymer of a poly epoxide and a polyimide.

268. (Previously added) The integrated circuit package of claim 261, wherein the material has a Shore A hardness of greater than about 70.

269. (Previously added) The integrated circuit package of claim 261, wherein the material has a Shore D hardness of greater than about 20.